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Glimpses of Semantic Web Technologies and Related Case Studies

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***Abstract*—** Semantic web is a platform of new evolution in rapidly developing World Wide Web. Semantic web refers to extracting knowledge from large amount of data. The purpose of this paper is to give a first-hand information and description for the semantic web technology. Although several research works have been carried out in the high semantic web technology, the semantic web is yet vastly unexplored. A semantic web technological innovation is rapidly changing traditional methods of searching data and how search engines work. Few prominent semantic web case studies are presented. One of the popular applications of XML RDF is Really Simple Syndication (RSS) feed which is discussed in detail.

Keywords- *Extensible Markup Language, Intelligent Search Engine, Ontology, Really simple Syndication, Resource Description Framework. SPARQL, World Wide Web*

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I. INTRODUCTION

Introduction of Semantic Web

World Wide Web comprises of heterogeneous data which may be structured, semi-structured or unstructured. Such a heterogeneous data poses significant problems in data interchange and communication between disparate web applications. Further, globalization adds another layer of complexity owing to heterogeneous locale, currency, culture and terminologies. Hence it becomes inevitable for setting up standards for promoting common data formats and exchange protocols on the web for the integration of heterogeneous subsystems into a single system focusing primarily at ease of data communication. Semantic web exactly address this issue by acting as an integrator across heterogeneous content and by providing a common framework for allowing a sharing and reuse of data across applications. With this advent of migrating web to a semantic web now machines can largely communicate with other machines effectively. Semantic web has wider applications in the cases where sharing of data is a common necessity such as research or business. Semantic web injects meaning into the content for describing structure of the content which enables machine to process knowledge instead or merely text which plays a key role in retrieving meaningful results from the data. Earlier focus was on document sharing while the present focus is on data sharing which can be realized if URL points to a data instead of document and data relationships can be modeled with additional URLs pointing to data.

A typical web document comprises of network of hyperlinked human readable web pages which pose difficulty in being accessed by machines connected to Internet. Semantic web framework converts the same into machine readable metadata about pages along with their interrelations which enable automation agents to access the web more intelligently and perform tasks in their absence. According to Tim Berners Lee, the inventor of World Wide Web, semantic web is a web of data which can be processed either directly or indirectly by machines.

Pitfall of HTML

A typical data on Internet can be broadly classified into two types.

- Human Readable Data
- Machine Readable Data

HTML is primarily a presentation language where the markup elements are utilized for coding body of the text containing various multi media objects and interactive forms. Metadata tags further provide a provision for categorizing the content of web pages. HTML only presents the data and does not describe it. It lacks description of the structure for embedded data, neither it describes the data nor any interrelationship between the data. Thus, HTML falls short in specifying the semantics of objects and delegates the presentation details to the browser to explore. For converting a traditional web application in to a semantic web application it is mandatory to convert the documents in HTML format and publish them in one of the languages specifically designed for data such as one of

- Resource Description Framework (RDF)
- Web Ontology Language (OWL) or
- Extensible Markup Language (XML).

Now the role of HTML is merely to describe the documents and link between them. RDF, OWL and XML describe data where as HTML links and presents them. Often these technologies are combined in order to either replace the existing web content or supplement it. In this context, web data may be viewed as a descriptive data stored in web-accessible databases or purely in XML or HTML interspersed with XML (XHTML) as the case may be.

"The Semantic Web is the representation of data on the World Wide Web. It is a collaborative effort led by W3C with participation from a large number of researchers and industrial partners. It is based on the Resource Description Framework (RDF), which integrates a variety of applications using XML for syntax and URIs for naming" .

The concept of the Semantic Web was brought by Tim Berners-Lee who is the inventor of the WWW, URIs, HTTP, and HTML [1]. Today's Web is a human-readable Web where information cannot be easily processed by machine. The efforts of the Semantic Web are to make a machine processable form for expressing information.

Nowadays, there are a huge amount of resources on the Web, which raises a serious problem of accurate search. This is because data in HTML files is useful in some contexts but meaningless under other conditions. In addition, HTML cannot provide description of data encapsulated in it. For example, we want to find an address' details and know its postcode. Since the names of the postcode system are different in many countries and the Web doesn't represent this relationship, we may not get what we expect. By contrast, in the Semantic Web, we can indicate this kind of relationship such as zip code is equivalent to postcode. So when the majority of data on the Web are presented in this form, it is difficult to use such data on a large scale. Another shortcoming is that today's Web lacks an efficient mechanism to share the data when applications are developed independently. Hence, it is necessary to extend the Web to make data machine-understandable and integrated and reusable across various applications

To make the Semantic Web work, well-structured data and rules are necessary for agents to roam the Web

The main aim of the Semantic Web is to enable the integration of structured and semi structured data sources over the Web. The main point is to expose datasets on the Web in RDF (Resource Description Format) format and to use RDF Schema to express the intended semantics of these datasets. A typical use is the combination of research geo data to provide an enriched information source.

The aim of the Semantic Web is to Improve
the current World Wide Web
Typical uses are:
-Improved search engines
-Dynamic personalization of Web sites
-Semantic enrichment of existing Web pages

The sources of the required semantic metadata are mostly claimed to be automated sources
-Concept extraction
-Named-entity recognition
-Automatic classification

More recently the insight is gaining ground that the required semantic markup can also be produced by social mechanisms in communities that provide large-scale human-produced markup.

The search engine is also bound to contain errors due to the method of data collection. The search for co-occurrence is carried out on the syntactic level and shows the typical drawbacks of internet search. For example, it is possible that some of the returned pages are about a different person than the one intended by the query. Ambiguity particularly affects people with common names, e.g. Steven Hozler. This danger is mitigated by including the disambiguation term in the query. Queries for researchers who commonly use different variations of their name (e.g. Jim Hendler vs. James Hendler) or whose names contain international characters (e.g. Jerome Euzenat) may return only a partial set of all relevant documents known to the search engine. 15 Name ambiguities also effects Google Scholar. For example, the person "York Sure" is identified as a co-author of publications that are published in New York. So we have to use semantic web application and technology and improve quality of search.

II. SEMANTIC WEB TECHNOLOGIES

The Semantic Web takes the solution further. It involves publishing in languages specifically designed for data: Resource Description Framework (RDF), Web Ontology Language (OWL), and Extensible Markup Language (XML) [2]. HTML describes documents and the links between them. RDF, OWL, and XML, by contrast, can describe arbitrary things such as people, meetings, or airplane parts. These technologies are combined in order to provide descriptions that supplement or replace the content of Web documents. Thus, content may manifest itself as descriptive data stored in Web-accessible databases, or as markup within documents.

XML, RDF and Web Ontology language (OWL) are three important technologies and also important SPARQL (Search Protocol and RDF Query Language).

XML

The foundation on which the Semantic Web is based is XML-the extensible Markup Language.XML is a framework that allows users to define application-specific markup languages. The key objective is interoperability of documents and data. Central for XML are Document Type Definitions (DTD), which allow us to define an application specific vocabulary (in the form of tags) and a grammar for the syntactical use of these tags (in terms of hierarchy, sequence, repetition, option, etc). Documents or data are then described based on the defined vocabulary and rules in XML files.

"Markup is information added to a document that enhances its meaning in certain ways, in that it identifies the parts and how they relate to each other." (- Erik T. Ray).Markup language is kind of mechanism organizing the document with a set of symbols, e.g. this article is labeled with different fonts for headings. Markup use similar methods to achieve its aims. Markup is important to implement machine-readable documents since a program need to treat different part of a document individually.

Many computer systems contain data in incompatible formats. Exchanging data between incompatible systems (or upgraded systems) is a time-consuming task for web developers. Large amounts of data must be converted, and incompatible data is often lost.

XML stores data in plain text format. This provides a software- and hardware-independent way of storing, transporting, and sharing data.

XML also makes it easier to expand or upgrade to new operating systems, new applications, or new browsers, without losing data. With XML, data can be available to all kinds of "reading machines" like people, computers, voice machines, news feeds, etc.

Description Framework (RDF)

The Resource Description Framework (RDF) [3] is a family of World Wide Web Consortium (W3C) specifications originally designed as a metadata data model. It has come to be used as a general method for conceptual description or modeling of information that is implemented in web resources, using a variety of syntax notations and data serialization formats. It is also used in knowledge management applications. RDF was adopted as a W3C recommendation in 1999. The RDF 1.0 specification was published in 2004, the RDF 1.1 specification in 2014.

RDF documents are written in XML. The XML language used by RDF is called RDF/XML. By using XML, RDF information can easily be exchanged between different types of computers using different types of operating systems and application languages.

RDF allows us to express the semantics of concepts using triples of subjects, properties, and objects. Subjects, properties and objects are identified by URIs (Uniform Resource Identifiers), i.e. newly defined concepts are associated with a unique identifier. Firstly, anyone can define a new concept, and, secondly, concepts that are syntactically the same can be defined differently, associated with different URIs.

It is said that the Semantic Web is about adding logic to the Web, which means that rules are used to make inferences. For example, based on facts (there is a concept example, e.g. a database table) and inference rules (an example is always preceded by a definition – formulated as a triple) we can infer that there is a definition of a database table for a table example, and we can search the content using the corresponding definition and table tags.

As one of the World-Wide Web consortiums standardized technologies, RDF has the potential of becoming a widely accepted standard. In particular the lack of shared understanding and standardization of knowledge representation has so far hindered the success of this technology.

Web Ontology

RDF allows us to express semantics. However, in order to be applicable, a further problem needs to be addressed. There can still be a number of knowledge repositories that use different URIs to identify the same concept.

The OWL is a language derived from description logics, and offers more constructs over RDFS[4]. It is syntactically embedded into RDF, so like RDFS, it provides additional standardized vocabulary. OWL comes in three species - OWL Lite for taxonomies and simple constrains, OWL DL for full description logic support, and OWL Full for maximum expressiveness and syntactic freedom of RDF. Since OWL is based on description logic, it is not surprising that a formal semantics is defined for this language.

The term "ontology" can be defined as an explicit specification of conceptualization. Ontology captures the structure of the domain, i.e. conceptualization. This includes the model of the domain with possible restrictions. The conceptualization describes knowledge about the domain, not about the particular state of affairs in the domain

Ontology

Ontology solves the problem of finding out whether two concepts actually mean the same thing. Ontology formally defines the relationship among concepts. Typically, ontology consists of a taxonomy that relates terms and a set of inference rules to deduce new knowledge. Ontology can be represented as documents that can be published, exchanged and shared on the Web.

Searching the Web can be improved through ontology. A search can be based on a particular definition of a concept. Information on a page (e.g. representing course content) can be related to associated knowledge structures and inference rules – Currently, some effort is being made to define an ontology language for the Web –Ontology allows content providers and content requestors to cooperate. Properties of provided content need to satisfy the requirements of the requestor. These properties are complex concepts. Ontology allows different terminologies to be reconciled. Their inference systems allow us to decide whether a provided learning component matches the requirements.

SPARQL

SPARQL is a query language for RDF.SPARQL can be used to express queries across diverse data sources, whether the data is stored natively as RDF or viewed as RDF via middleware[5]. SPARQL contains capabilities for querying required and optional graph patterns along with their conjunctions and disjunctions. SPARQL also supports extensible value testing and constraining queries by source RDF graph. The results of SPARQL queries can be results sets or RDF graphs. The current version of SPARQL is SPARQL 1.1, which supersedes the older version published in 2008.
SPARQL is the query language of the Semantic Web. It lets us:

- Pull values from structured and semi-structured data
- Explore data by querying unknown relationships
- Perform complex joins of disparate databases in a single, simple query
- Transform RDF data from one vocabulary to another

Structure of a SPARQL Query

A SPARQL query comprises, in order [5]

- *Prefix declarations*, for abbreviating URIs
- *Dataset definition*, stating what RDF graph(s) are being queried
- A *result clause*, identifying what information to return from the query

- The *query pattern*, specifying what to query for in the underlying dataset
- *Query modifiers*, slicing, ordering, and otherwise rearranging query results.

```
# prefix declarations
PREFIX foo: <http://example.com/resources/>
...
# dataset definition
FROM ...
# result clause
SELECT ...
# query pattern
WHERE {
   ...
}
# query modifiers
ORDER BY ...
```

Example:-

Find me the homepage of anyone known by Tim Berners-Lee.

```
PREFIX foaf:  <http://xmlns.com/foaf/0.1/>
PREFIX card:  <http://www.w3.org/People/Berners-Lee/card#>
SELECT ?homepage
FROM <http://www.w3.org/People/Berners-Lee/card>
WHERE {
   card:i foaf:knows ?known .
   ?known foaf:homepage ?homepage .
}
```

- The *FROM* keyword lets us specify the target graph in the query itself.
- By using ?known as an object of one triple and the subject of another, we traverse multiple links in the graph.

Expected Results:-

homepage

<http://purl.org/net/eric/>

- *Dataset definition*, stating what RDF graph(s) are being queried
- A *result clause*, identifying what information to return from the query
- The *query pattern*, specifying what to query for in the underlying dataset
- *Query modifiers*, slicing, ordering, and otherwise rearranging query results.

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# prefix declarations
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# result clause
SELECT ...
# query pattern
WHERE {
   ...
}
# query modifiers
ORDER BY ...
```

Example:-

Find me the homepage of anyone known by Tim Berners-Lee.

```
PREFIX foaf:  <http://xmlns.com/foaf/0.1/>
PREFIX card:  <http://www.w3.org/People/Berners-Lee/card#>
SELECT ?homepage
FROM <http://www.w3.org/People/Berners-Lee/card>
WHERE {
   card:i foaf:knows ?known .
   ?known foaf:homepage ?homepage .
}
```

- The *FROM* keyword lets us specify the target graph in the query itself.
- By using ?known as an object of one triple and the subject of another, we traverse multiple links in the graph.

Expected Results:-

homepage

<http://purl.org/net/eric/>

<http://www.mellon.org/about_foundation/staff/program-area-staff/irafuchs>

<http://www.johnseelybrown.com/>

<http://heddley.com/edd/>

Semantic Web Architecture

The architecture of semantic web is depicted in Figure 1 [1].

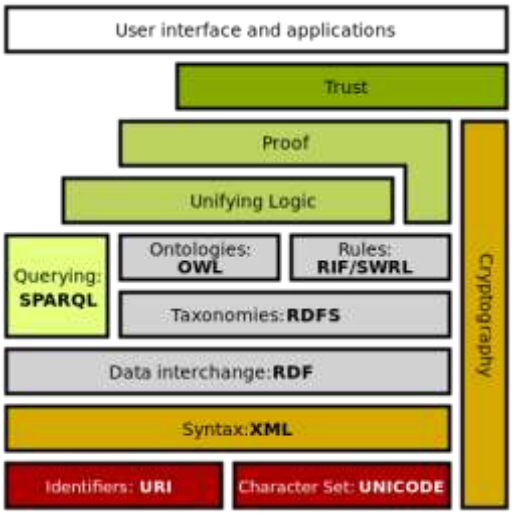

Figure 1. Architecture of Semantic Web

III. CHALLENGES OF SEMANTIC WEB

Some of the challenges for the Semantic Web include vastness, vagueness, uncertainty, inconsistency, and deceit [1]. Intercommunication between machines and automated

reasoning systems will have to deal with all of these issues in order to meet the challenges posed by semantic web.

- ✓ **Vastness** - The World Wide Web currently is embedded with billions of pages which is exponentially growing on a monthly basis and the technology in place is not able to clean the data by eliminating syntactically duplicate terms. Any automated reasoning system will have to deal with enormously large input.
- ✓ **Vagueness** - Vagueness refers to the imprecision implicit in the concepts which has its source from imprecision present in user queries , concepts represented by content providers which poses a problem in matching query terms to provider terms while trying to consolidate different knowledge bases containing overlapping concepts. Fuzzy logic is the soft computing technique used to deal with such imprecision or vagueness using linguistic terms and overlapping membership functions.
- ✓ **Uncertainty** - A typical concept may contain few features with uncertain values each with a different probability which can very well be addressed using probabilistic reasoning techniques.
- ✓ **Inconsistency** - When ontologies from separate sources are combined, logical contradictions may creep in during the development of larger ontologies in which case deductive reasoning fails and defeasible reasoning and para consistent reasoning are two techniques that can be employed to deal with inconsistency
- ✓ **Deceit** - This is when the producer of the information is intentionally misleading the consumer of the information. Cryptography techniques are currently utilized to alleviate this threat

The following table summarizes the challenge involved in semantic web and the technology in place to address the challenge.

Challenge in Semantic Web	Technological solution
Vastness	Latent Semantic Analysis
Vagueness	Fuzzy Logic
Logical Contradiction involved in merging ontologies from separate sources	Defeasible reasoning and Para consistent reasoning
Deceit	Cryptography

IV. LATENT SEMANTIC ANALYSIS

Latent semantic analysis (LSA) [6] is a technique in natural language processing used for analyzing relationships between a set of documents and the terms they contain by producing a set of concepts related to the documents and terms.

LSA works as shown in the following steps [6]

- ✓ It assumes that words that are close in meaning will occur in similar pieces of text.
- ✓ A matrix containing word counts per paragraph where rows represent unique words and columns represent each paragraph, is constructed from a large piece of text
- ✓ A mathematical technique called singular value decomposition (SVD) is used to reduce the number of rows while preserving the similarity structure among columns.
- ✓ Words are then compared by taking the cosine of the angle between the two vectors which is the dot product between the normalizations of the two vectors formed by any two rows, if V1 and V2 represent two vectors then $V1.V2 = |V1||V2|COS(\Theta)$
- ✓ Values close to 1 represent very similar words while values close to 0 represent very dissimilar words

Various advantages and disadvantages of LSA are depicted below [7].

Advantages of LSA.

- ✓ Easy to comprehend, implement and apply. There are numerous practical and scalable implementations of semantic web currently available, mahout (java), gensim (python), scipy (svd python) to name a few. Of these mahout targets big datasets which demands the availability of parallel computational resources while others address moderate data size.
- ✓ Latent Semantic Analysis (LSA) is reliable, capable of handling data sets with diverse topics and outscores plain vector space model in performance.
- ✓ LSA is also capable of handling frequently occurring synonym problems in datasets.
- ✓ LSA involves decomposition of term document matrix which renders it faster compared to other models based on dimensionality reduction.
- ✓ It is insensitive to initial conditions and hence is consistent.
- ✓ Application of LSA to new dataset is easier and faster compared to other similar methods.

Disadvantages of LSA

- ✓ Since it is a distributional model, it lacks efficient representation as compared to deep neural networks.
- ✓ Due to the depth involved in representation, indexing based on individual dimensions is hard.
- ✓ It is a linear model and hence fails to address non-linear dependencies.
- ✓ The model is not human readable and hence not easy to interpret like Latent Dimension Analysis.

✓ Deciding on the number of topics is based on heuristics and demands some expertise.

V. RSS FEED – APPLICATION OF XML/RDF

Most appealing application of XML/RDF is RSS (Really Simple Syndication) feed which facilitates sharing of content between websites and enables distributing up-to-date content from content provider websites to numerous content consumer websites thereby enabling fast browsing for content updates which is more suitable for thin clients. This sharing is promoted by RSS aggregators, a program that gathers RSS feeds. Without RSS end users will have to check websites for new updates.

In the RSS Producer-Consumer architecture there are four prominent actors.

- RSS Aggregator
- RSS Reader
- RSS Consumer
- RSS Updater

Figure 2 depicts RSS Producer-Consumer architecture.

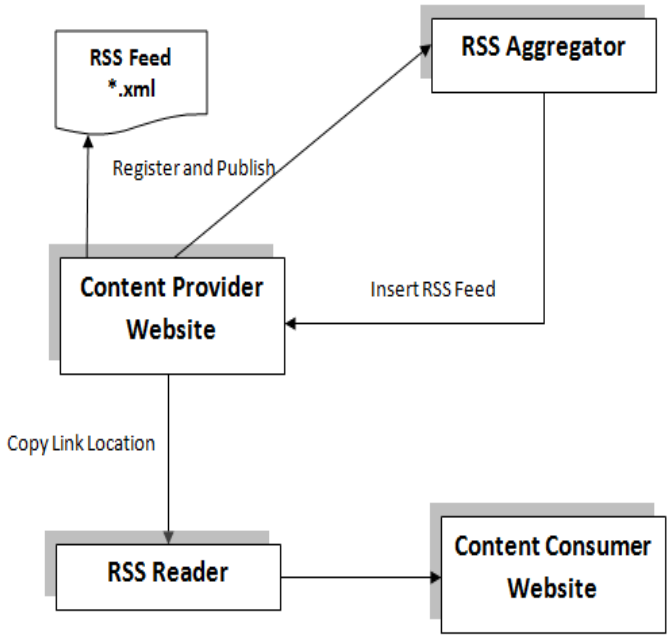

Figure 2. RSS Producer-Consumer architecture

Figure 3. depicts the control flow diagram for creating, publishing and reading RSS feed.

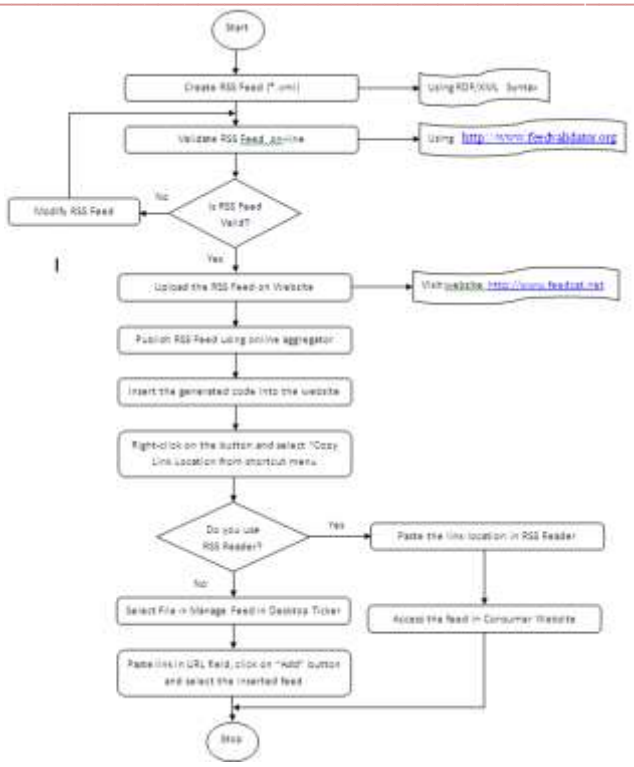

Figure 3. Control flow diagram for creating, publishing and reading RSS feed

The various steps involved in creating and publishing the RSS Feed are enumerated below : [8]

i. Creating RSS Feed

Create RSS Feed as shown below:

```
<?xml version="1.0" encoding="UTF-8" ?>
<rss version="2.0"
xmlns:atom="http://www.w3.org/2005/Atom">
<channel>
  <title>CSIBER Home Page</title>
  <link>http://www.siberindia.edu.in</link>
 <description>CSIBER Website</description>
 <atom:link  href=" http://
  www.siberindia.edu.in/xml/rssfeed.xml" rel="self"
  type="application/rss+xml" />
 <item>
  <title>Home Page</title>
 <link>http://www.siberindia.edu.in/xml/rssfeed.xml
            </link>
  <description>CSIBER Website</description>
  <guid>http://www.siberindia.edu.in/xml/item0768
            </guid>
 </item>
</channel>
</rss>
```

ii. Create XML folder in web root and copy the file with the extension rssfeed.xml.

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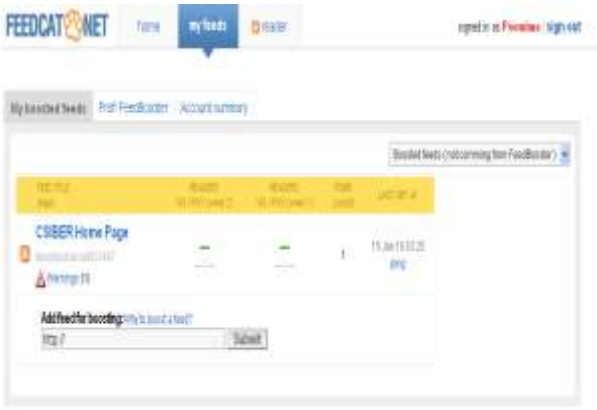
iii. Validate the RSS Feed using online feed validator, (http://www.feedvalidator.org)

If the XML document is valid and well-formed you get the following message

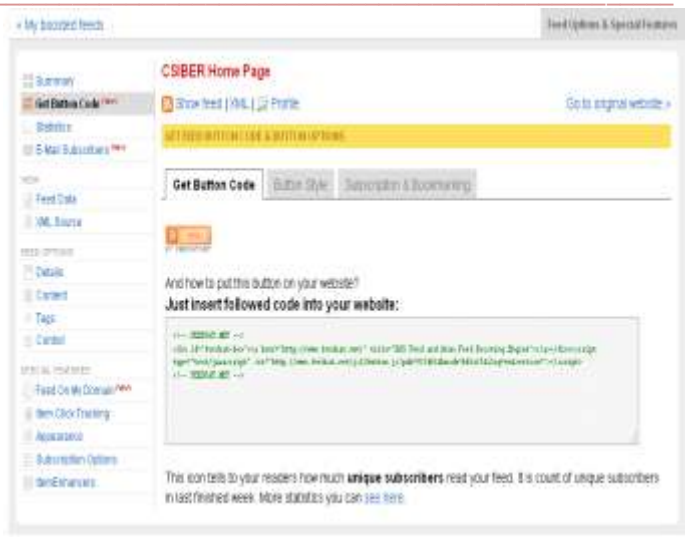
Publishing RSS Feed

iv. Visit the website http://www.feedcat.net/my-feeds/
v. Select MyFeeds tab as shown below:



vi. Enter the filename of the XML file containing the RSS Feed and click on submit button.

vii. Enter the details and click on Continue button

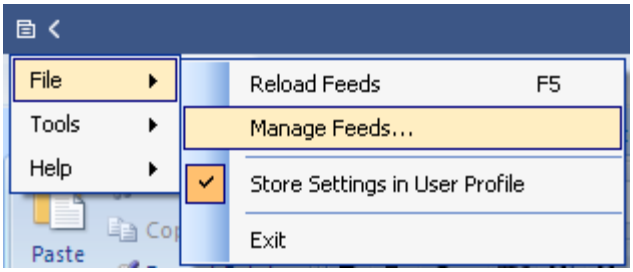


viii. The following button will appear on your home page

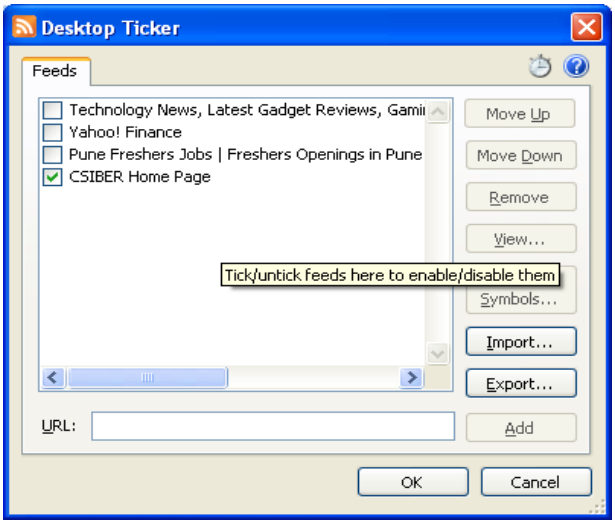
ix. Right-click on the button and select "Copy Link Location" from the shortcut menu.

x. Download Desktop Ticker and launch it.

xi.Select "Manage Feeds" option from shortcut menu.



xii. Copy the Feed Link Location in URL Field. Select it and click on OK button.



xiii. The scrolling text appear at the top of the desktop as shown below:

A unique application of RSS Feed is there are sites which provide content on useful aspects such as technological changes, job openings for freshers in various fields. Such feeds can be integrated using desktop ticker and content can be viewed on daily basis without manually visiting these sites.
Examples of two such sites are Times of India sharing Technological advancements
http://timesofindia.indiatimes.com/rssfeeds/5880659.cms
and Freshers IT openings in Pune
http://www.freshersbazaar.com/rss-feeds/pune-jobs-rssfeed.xml
When these are integrated in Desktop Ticker, new openings can be monitored periodically.
Few tickers are shown below:

VI. SEMANTIC WEB USE CASES AND CASE STUDIES

How Semantic Web technologies are used by companies and institutions

-Case Studies describe deployed systems that have been deployed within an organization.
-Use Cases are systems an organization has built as a prototype system, but it is not currently being used by business functions.
All use cases and case studies have been submitted by the relevant institution

Case studies:-

1] An Intelligent Search Engine for Online Services for Public Administrations (by Jesús Fernández Ruíz,Municipality of Zaragoza, Spain)
- This is Semantic Web based search engine for public services .The search is based on natural language processing and ontological reasoning

2] Contextual Search for Volkswagen and the Automotive Industry (by William Greenly, Charles Sandeman-Craik,Yago Otero, and John Streit, Tribal DDB UK and Volkswagen UK, United Kingdom)
-In this system provide a visual, faceted search over the products of Volkswagen.

3] CRUZAR — An application of semantic matchmaking for eTourism in the city of Zaragoza (by Maria Jesus Fernandez and Antonio Campos, Municipality of Zaragoza and CTIC Foundation, Spain)
-Portal to help tourists in planning their city tour based on their personal profile and integration of different data sources related to points of interest, data on events, photos and maps.

4] Enhancing Content Search Using the Semantic Web (by Mike DiLascio and Justin Kestelyn, Siderean Software and Oracle Corporation, United States)
-Oracle Technology Network (OTN) aggregates many sources of content through a single portal. Advantages of this portal is enhanced search and navigation, better user interface, better queries through SPARQL.

5] iLaw—Intelligent Legislation Support System (by Pyung Kim, Seungwoo Lee, Hanmin Jung, Mi-Kyoung Lee, Dong Min Seo, Won-Kyung Sung, Beom-Jong You, Jong-Sub Lee, Tae-Wan Kim, and Seong-Hwan Park, KISTI and MOJ, Korea)

-In this Portal provides legal services to government departments enabling them: - to review bills or legal cases in a wider and international Framework and compare to similar legislation home and abroad, In this system data integrate legal cases from US, Japan, and the EU countries, plus legal articles and academic papers .

6] Improving Web Search Using Metadata
(by Peter Mika, Yahoo!, Spain and United States)
-- Yahoo use Search Monkey application to reuses structural data and to improve search result
output with applications added to personalized search pages.

7] POPS — NASA's Expertise Location Service Powered by Semantic Web Technologies (by
Michael Grove and Andrew Schain, Clark & Parsia
, LLC, and NASA, United States)
-In This System integrates the data over 70,000 employee and contractors using RDF and provides a nice user interface to search the data possibly combines that with external data

8] Semantic Content Description to Improve Discovery (by Kevin Smith, Vodafone Group Research & Development, United Kingdom)
-Integrate various vendors product descriptions via RDF (e.g. Ring tones, games, wallpapers, manage complexity of handsets, binary Formats). A portal is created to offer appropriate Content and Significant increase in content download after the introduction.

9] Semantic Web Technology for Public Health Situation Awareness (by Parsa Mirhaji, School of Health Information Sciences, University of Texas,United States)
-In this Portal Improve search related to Health Awareness situation using Natural language search.

10] The Semantic Web for the Agricultural Domain, Semantic Navigation of Food, Nutrition and Agriculture Journal (by Gauri Salokhe, Margherita Sini, and Johannes Keizer,
Food and Agriculture Organization of the United Nations, Italy)

-Development of AGRIS application to improve search interface related to Food, Nutrition and Agriculture Journals.

11] Use of Semantic Web Technologies in Natural language interface to Business Applications (by C. Anantaram, Tata Consultancy Services Limited, India)

-users interact with a business application in natural language by passing questions and invoking tasks (e.g. by emails). Domain OWL ontology helps in the retrieval of relevant data
and concepts.

12] Use of Semantic Web Technologies on the BBC Web Sites (by Yves Raimond, Tom Scott, Patrick Sinclair, Libby Miller, Stephen Betts, and Frances McNamara, BBC, United Kingdom)

- It is the Web as a content management system e.g. on the BBC Music site- for each artist information is made available and content is gathered from public and linked databases.e.g. MusicBrainz, Wikipedia/DBPedia, etc.Web site shows an aggregated view put into a BBC context

Use Cases:-

1] WEASEL, Vodafone R&D Corporate Semantic Web (by Juan José Valverde Fúster, Vodafone Group Research & Development, Spain and United Kingdom)

- In this use case provide one semantic search engine to Vodafone employees including natural language search because large data available in this company. Search engine provide structured data related to requirement.

2] Semantic Web Technologies in Automotive Repair and Diagnostic (by François-Paul Servant, Renault, France)

-A user progressively discovers the information instructed by the application to perform tests and enter their results.

3] Mobile Content Recommendation System (by Tony Lee, Kono Kim, Eddie Choi, and Seong Rae Park, Saltlux, Korea)

- In this use case Analyze the user behavior of IP network users of Korea Telecom Freetel and build user characterization based on usage history using user preference, time, place, weather, etc.

4] Helping New Judges Answer Complex Legal Questions (by Pompeu Casanovas, Spanish General Council of the Judiciary, Spain)

-In this system provide FAQ Search System with natural Language interface and use data the questions and answers expert knowledge of over 400 judges from all over Spain

5] Drug Ontology Project for Elsevier (DOPE) (by Anita de Waard, Christiaan Fluit, and Frank van Harmelen, Elsevier, Aduna, and Vrije Universiteit Amsterdam, The Netherlands)

-Goal of this use case is to provide a single interface access to multiple information Sources (in the life science domain) and also Provide a search facility and browser using the thesauri and the metadata to help search, find related items, etc

8. Conclusion:-

The concept of semantic web provides a new opportunity for the development of web applications. Semantic web is very active research area. Today's world demands a well structured or semi-structured data over the web and technological innovations. Using semantic web we can improve a search engines. This paper provides information related to semantic technologies, advantages, use cases and case studies. In future using this information we are planning to create a new tool employing semantic web technology for pulling out data related to in computer and management studies and display it in the required format. This technique is suitable for faster search of data within a fraction of second.

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